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Heart disease from the air we breathe

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Danderyds Sjukhus



Cardiovascular disease

Very common and the leading cause of death in the EU

IMPACT OF CARDIOVASCULAR DISEASE

LIVING WITH CVD (EU)

60

MILLION

Total of people
living with
Cardiovascular
Disease today



13

MILLION

New cases of
Cardiovascular
Disease each year

COSTS OF CVD (EU)

€ **111** BILLION
Healthcare costs

€ **54** BILLION
Productivity loss

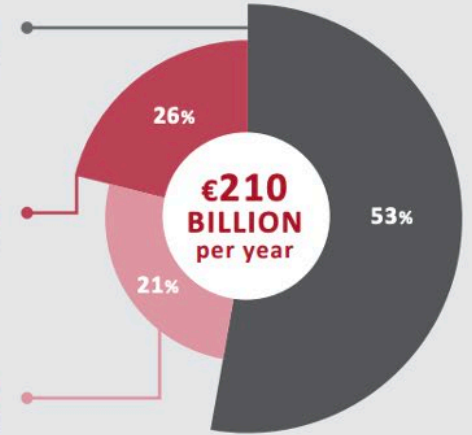
€ **45** BILLION
Informal care costs

€ **210**
BILLION
per year

26%

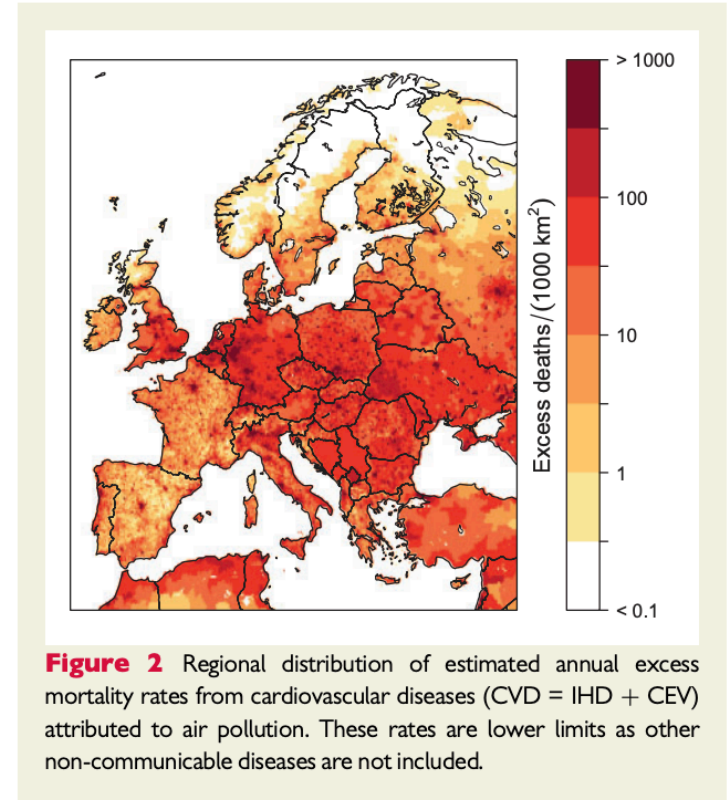
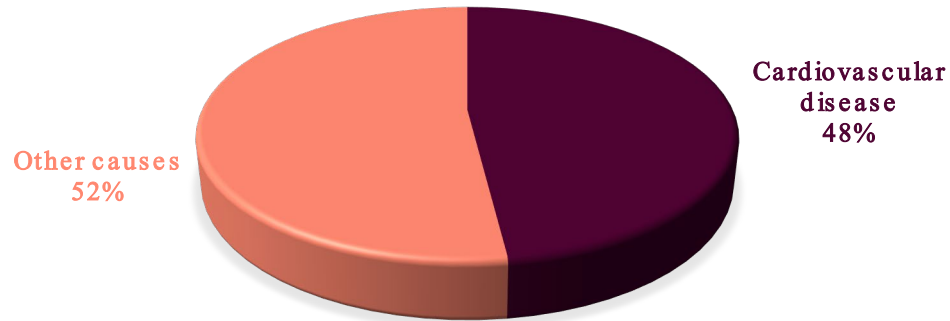
21%

53%

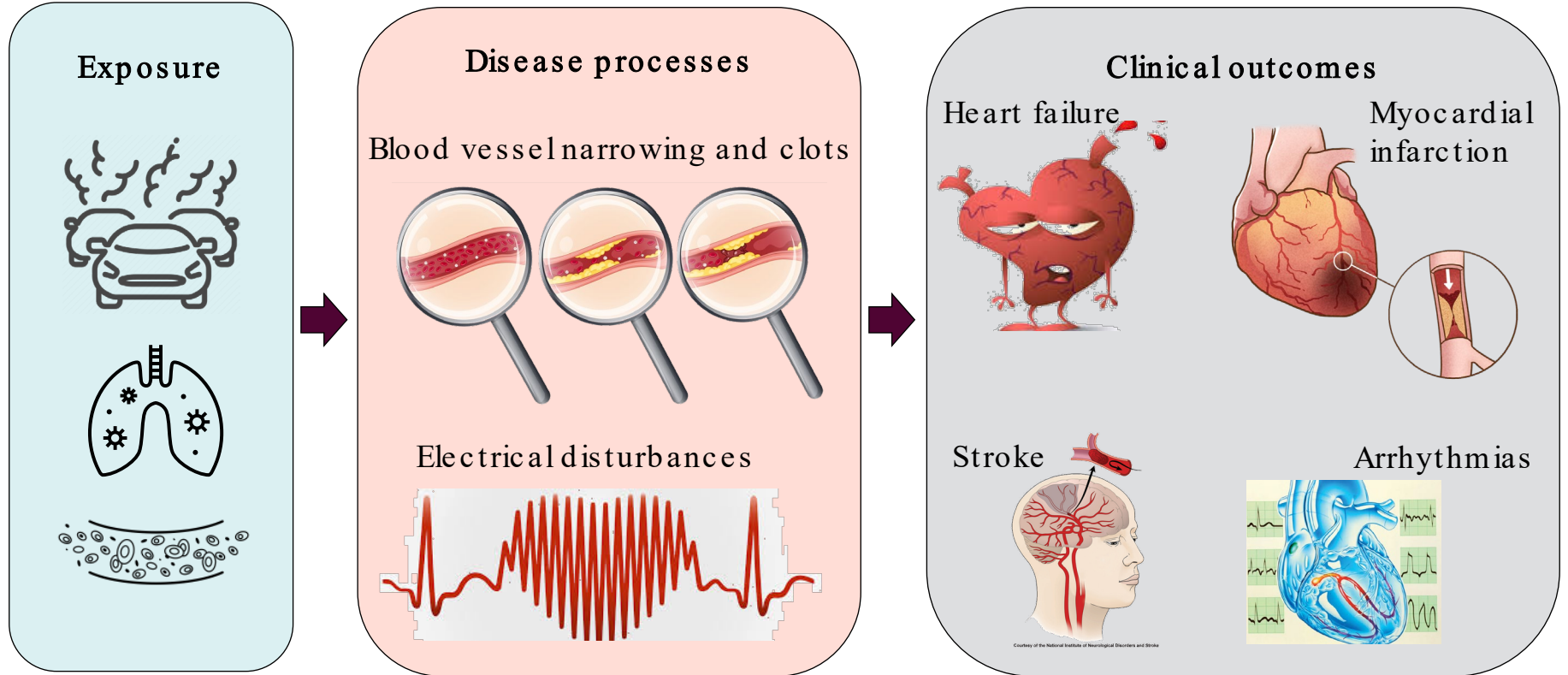


Cardiovascular deaths from air pollution across Europe

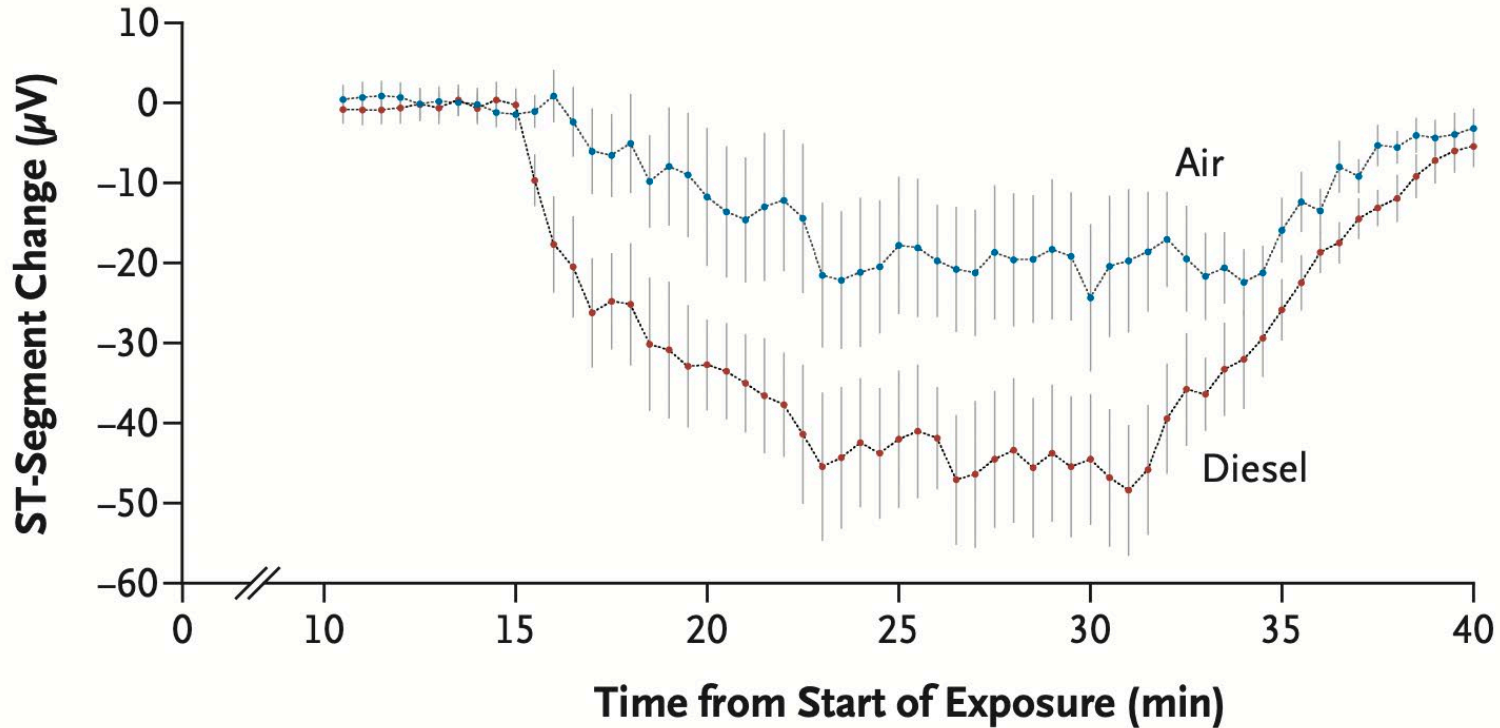
PROPORTION OF AIR POLLUTION DEATHS FROM CARDIOVASCULAR DISEASE



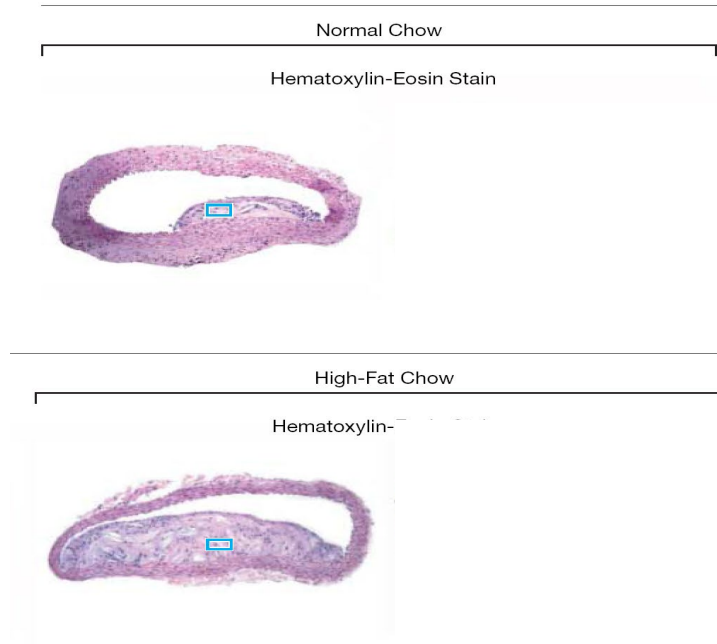
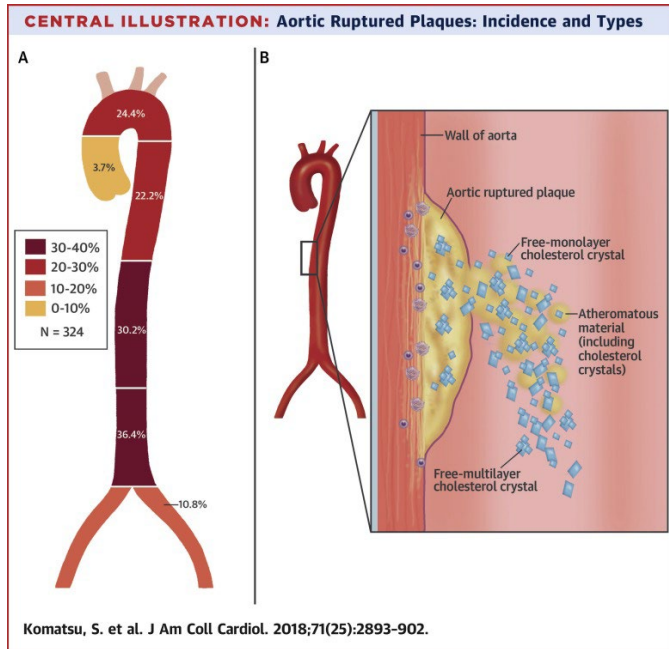
How does air pollution affect your heart?



Immediate coronary effects of diesel



Air pollution increases atherosclerosis



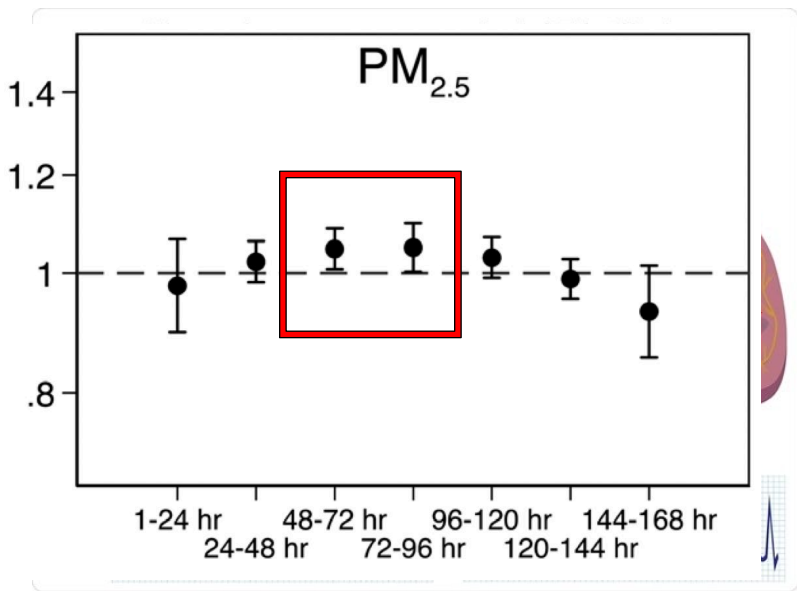
(n=28 apoE^{-/-} mice;
 6 months, 6hr/day*5
 day/week)

Filtered air

PM_{2.5}

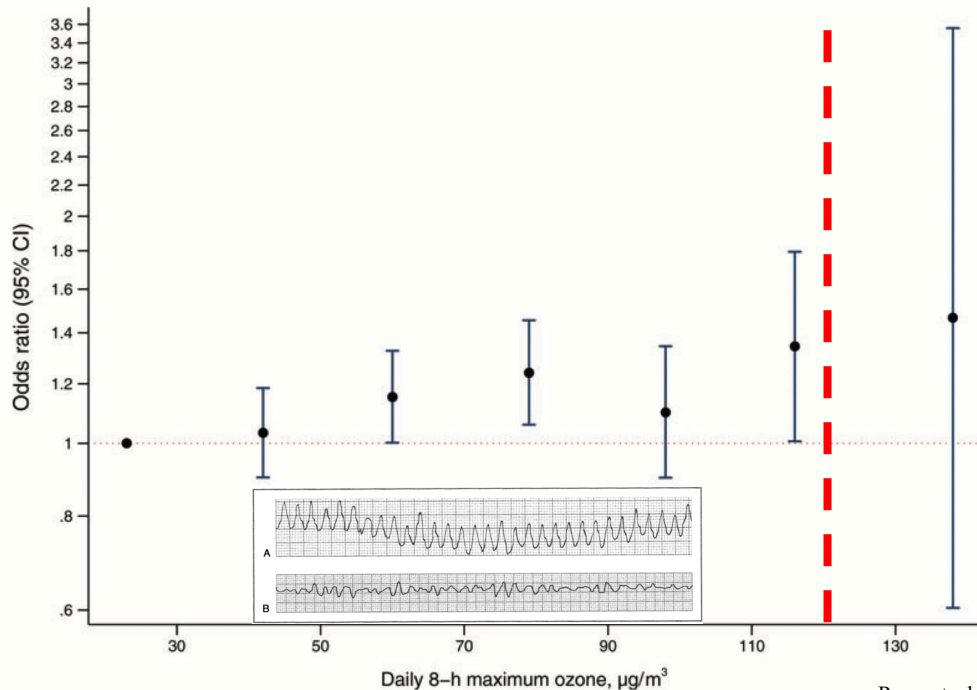
Air pollution and arrhythmias at very low levels

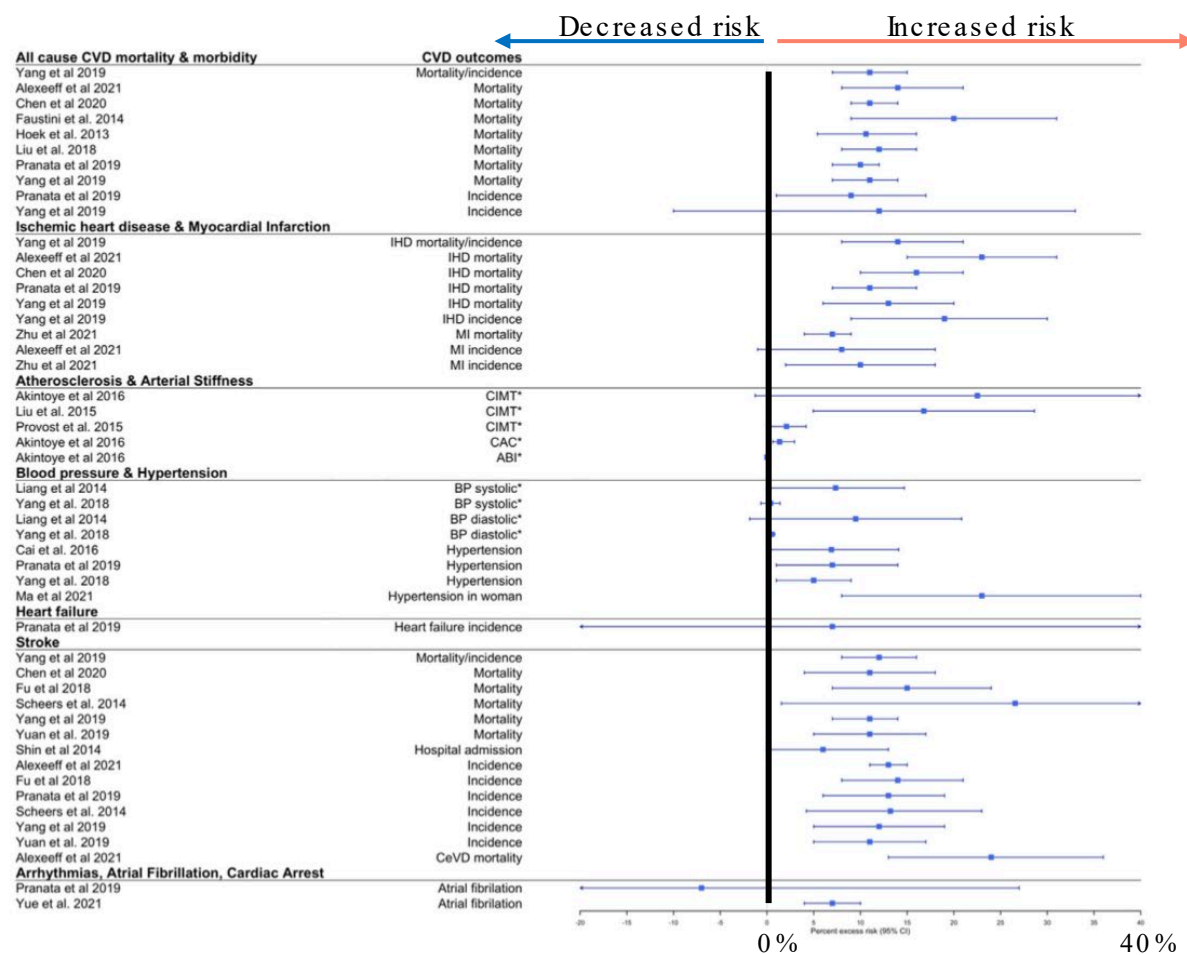
Atrial Fibrillation



Mean 4.7 $\mu\text{g}/\text{m}^3$

Cardiac Arrest





Air pollution affects a multitude of cardiovascular outcomes

Fig. 5 Effect estimates of the association between long-term exposure to $PM_{2.5}$ and CVDs. Note: we selected the main effect estimate from the meta-analyses if multiple effect estimates were available for each CVD outcome in the same meta-analysis. Effect estimates are estimated per $10 \mu g/m^3$ range increase in $PM_{2.5}$. Abbreviations: ABI, ankle-brachial index, BP, blood pressure; CAC, coronary artery calcification; CeVD, cerebrovascular diseases; CIMT, carotid intima-media thickness test; CVD, cardiovascular diseases; IHD, ischemic heart diseases; MI, myocardial infarction; PM, particulate matter. *Beta coefficient (linear regression) for change in systolic, diastolic, CIMT, CAC, or ABI values per increase of $PM_{2.5}$.

Conclusions

1. Cardiovascular diseases are the most common causes of death and disease in the EU with considerable impacts on health and related costs
2. Air pollution contributes to a range of cardiovascular diseases as well as to a large proportion of all cardiovascular diseases
3. Stricter control of air pollution offers an effective strategy that will prevent new disease, reduce suffering and save many lives from the consequences of cardiovascular disease in the EU.



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